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2nd International Symposium for Sustainable Landscape Development

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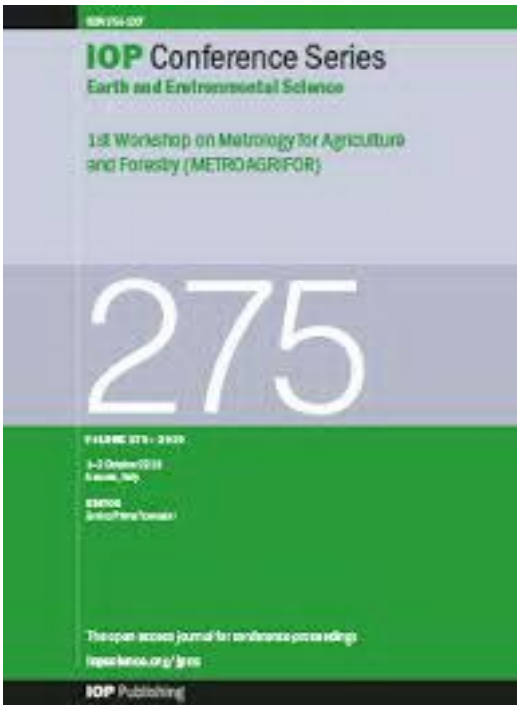


Related content

- Foreword
  Zhuang Qi Hu
- Foreword
  Lord Rutherford
- The 3rd International Symposium on LAPAN-IPB Satellite: For Food Security and Environmental Monitoring 2016

FOREWORD

Landscape development is facing very high acceleration changes, considering the growth and development of a region. As a result of human activities, various negative impacts arose for the landscape development, such as the loss of greenery open space (GOS) and blue open space (BOS), decreased quality of comfort-related micro-climate, the omission of the potential landscape services as well as a variety of others environmental problems.

Awareness of the importance of sustainable landscape development has been proclaimed by the United Nations (UN) in the Sustainable Development Goals (SDGs) program at Goal 11th, namely *to make cities and human settlements inclusive, safe, resilient and sustainable* (source: https://sustainabledevelopment.un.org/sdg11). A way to ensure the achievement entire SDGs (2016-2030) are to involve communities in the implementation and attainment in accordance with **nawacita** Indonesia. Therefore, it is needed to bridge and facilitate the role of the community in order to realize the SDGs with **nawacita** that can be obtained in the form of scientific activities such as a symposium. The 2nd International Symposium for Sustainable Landscape Development (**The 2nd ISSLD**) is a continuation of the annually symposium, the sustainability of this activity is very important to be managed on a regular basis. The topic for this annually symposium has been adapted to specific conditions for each year.

The 2nd ISSLD was held on November 9-10, 2016 at the IPB International Convention Centre (IICC), Bogor, Indonesia. The 2nd ISSLD is jointly organized by the Department of Landscape Architecture, Faculty of Agriculture, Bogor Agriculture University (IPB), and the Directorate of Research and Innovation IPB (DRI IPB). This symposium produced 40 (forty) articles which are published in this issue of IOP Conference Series: Earth and Environmental Science (EES). Those articles were come from subtopic about green landscape, socio-cultural landscape, and landscape planning and design.

The 2nd ISSLD aims to assess the landscape issue through a variety of case studies related to the effort for achieving sustainable landscape development. Various ideas towards a sustainable landscape are currently an intense research topic in the international level such as research on urban resilience, ecocity, sustainable city, until the low carbon landscapes. At the 2nd ISSLD, the researchers, students, businessman, practitioners, stakeholders, and governments can meet each other and exchange ideas to jointly formulate effort to create sustainable and comfortable tropical landscape. Around 150 participants have joint the 2nd ISSLD that come from various academicians (A), businessman (B), government (G), community (C) and mass media (M) to reach an ABGCM penta helix collaboration for sustainable landscape development.

We are thankful to all authors who have contributed to yield a high scientific standard to this proceeding of the 2nd ISSLD. We are also grateful to IOP Publishing, especially Anete Ashton (Publisher, IOP Conference Series), for allowing us to guide some of the symposium results for being poublished in the IOP Conference Series: Earth and Environmental Science (EES). We are trully thank to all dedicated editorial and scientific committes who have reviewed and encouraged the authors to revised their papers. We also would like to thank Ministry of Research, Technology and Higher Education (*Kementerian Riset, Teknologi dan Perguruan Tinggi* - RISTEKDIKTI) for the opportunity to join the World Class University (WCU) agenda.

Regan Leonardus Kaswanto
Editor-in-Chief
Proceeding the 2nd ISSLD 2016

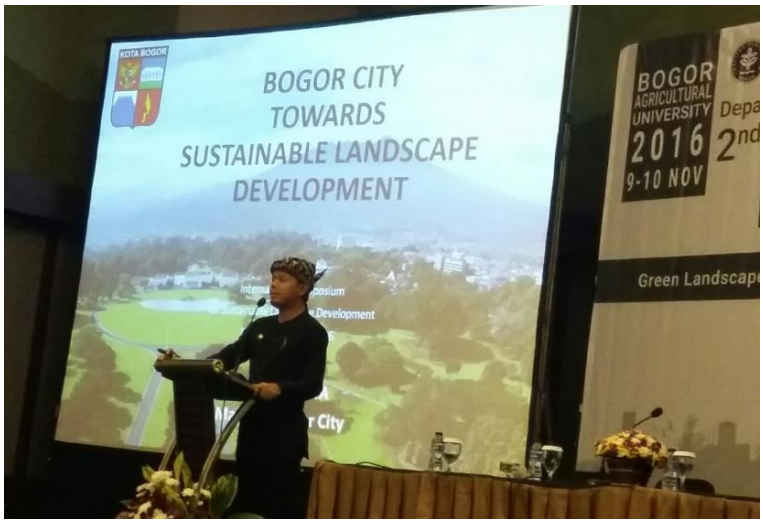
<< Kembali

The 2nd International Symposium for Landscape Sustainable (The 2nd ISSLD)

The Opening Ceremony

All participants take a photo session together

All keynote and invited speakers are discussing their ideas.



Mayor of Bogor City is giving a keynote speech.

Bogor City towards Sustainable Landscape Development.

Invited speakers are giving their presentation.

Giving appreciation to invited speaker for their presentation.

Excursion activity in Bogor Regency.

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October 2017

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2nd International Symposium for Sustainable Landscape Development

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FOREWORD

Landscape development is facing very high acceleration changes, considering the growth and development of a region. As a result of human activities, various negative impacts arose for the landscape development, such as the loss of greenery open space (GOS) and blue open space (BOS), decreased quality of comfort-related micro-climate, the omission of the potential landscape services as well as a variety of others environmental problems.

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Regan Leonardus Kaswanto

Editor-in-Chief

Proceeding the 2nd ISSLD 2016

List of Editorial Committees, Scientific Committees and Assistant Editors are available in this PDF.

https://doi.org/10.1088/1755-1315/91/1/011001

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Peer review statement

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All papers published in this volume of *IOP Conference Series: Earth and Environmental Science* have been peer reviewed through processes administered by the proceedings Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

https://doi.org/10.1088/1755-1315/91/1/011002

Green Landscape

OPEN ACCESS

Land Ecological on Public Transport Infrastructure Development In Indonesia

N Sari

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The development of public transport infrastructure in Indonesia has been growing rapidly since the last five years. The utilization of area as public transport infrastructure, for example bus depot, bus Station and terminal requires wide area and influences many elements, such as land ecological quality, water supplies, power supplies, and environmental balance. However the development of public transport infrastructure now days is less considering on environmental approach, especially for green and catchment area for water conservation (water balance).This paper aims to propose the concept of Public Transport Infrastructure using green concept. The green design concept is using GBCI (Green Building Council Indonesia) standard, which contains seven categories: land ecological enhancement, movement and connectivity, water management and conservation, solid waste and material, community wellbeing strategy, building and energy, and also innovation and future development. The result is, by using the GBCI standard for the green design of Public Transport Infrastructure, the land ecological impact could be decreased. The effective areas that required are at least 5000 m^2, from which the green areas for public increase 36% and 76% of areas could be used as catchment area for water conservation.

https://doi.org/10.1088/1755-1315/91/1/012001

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Land Use Cover Changes and Run Off Potention of Cipunten Agung Watershed Banten

A Karima and R L Kaswanto

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The changes of landscape form such as Land Use Cover Changes (LUCC) of Cipunten Agung watershed could be identified periodically in 1995, 2005, and 2015. In general, land utilization in Cipunten Agung classified into protected region and cultivated region. In 2011, total of protected area is 885.80 ha or 22.54% of watershed area. Those conditions affected both positively to the community development and negatively to the water quantity condition in Cipunten Agung such as flooding, run off, and erosion. Therefore, the purpose of this research is to analyze LUCC impacts to run off potential in Cipunten Agung watershed. Supervised classification method and Soil Conservation Services (Qscs) approach were correlated to determine the figure out an optimal solution to reduce the rate of LUCC. Cipunten Agung watershed imagery was classified into five classes, namely water bodies, forest, cultivated tree, settlement and paddy field. The result shows that area of cultivation tree and paddy fields are larger than others in midstream, and settlement is denser in downstream, particularly at riparian landscapes. The LUCC into paddy field often occur at two period 1995 to 2005 and 2005 to 2015 with several area are 530.92 ha and 388.17 ha. The Qscs method calculation result for 1995 until 2015 was affected by land use cover composition in each year and it was defined by Curve Number (CN). High rainfall in 1995 was generating high run off potential volume. Nevertheless, curve number value was increase get near to 100, which indicate the potential of run off volume increases along with LUCC in each year, those are 70.95; 72.47; and 72.81.

https://doi.org/10.1088/1755-1315/91/1/012002

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The Habitat Susceptibility of Bali Starling (*Leucopsar rothschildi* Stresemann> 1912) Based on Forest Fire Vulnerability Mappin in West Bali National Park

F Pramatana, L B Prasetyo and S B Rushayati

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Bali starling is an endemic and endangered species which tend to decrease of its population in the wild. West Bali National Park (WBNP) is the only habitat of bali starling, however it is threatened nowadays by forest fire. Understanding the sensitivity of habitat to forest & land fire is urgently needed. Geographic Information System (GIS) can be used for mapping the vulnerability of forest fire. This study aims to analyze the contributed factor of forest fire, to develop vulnerability level map of forest fire in WBNP, to estimate habitat vulnerability of bali starling. The variable for mapping forest fire in WBNP were road distance, village distance, land cover, NDVI, NDMI, surface temperature, and slope. Forest fire map in WBNP was created by scoring from each variable, and classified into four classes of forest fire vulnerability which are very low (9 821 ha), low (5 015.718 ha), middle (6 778.656 ha), and high (2 126.006 ha). Bali starling existence in the middle and high vulnerability forest fire class in WBNP, consequently the population and habitat of bali starling is a very vulnerable. Management of population and habitat of bali starling in WBNP must be implemented focus on forest fire impact.

https://doi.org/10.1088/1755-1315/91/1/012003

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The Role Of Wetland Ecosystems To Reduce The Concentration Of Nitrate In Groundwater

A J Sutrisno, Z Han, S Satake and K Fukumoto

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Nitrate is a compound very soluble in water. Ichikawa city is one of the cities that have a pear farming. In this city, there was a wetland where this area was surrounded by pear farming in upland areas. There were 3 sites (S4, R2, and S14) in this area.S4 and S14 were close to pear farming, but R2 was in the middle of wetland. We used piezometers with different depth (1m, 2m, and 3m) in each site. The focus in this study is identification the role of wetland ecosystem as a green infrastructure to reduce nitrate concentration. Groundwater flow in the wetland comes from pear farming with 2 flow direction. First, groundwater comes from S4 with average nitrate concentration was 185.73 mg/L and average DO concentration 6.37 mg/L. Second, groundwater comes from S14 with average nitrate concentration was 190.29 mg/L and average DO concentration 7.00 mg/L. All this direction flow to the middle of wetland (R2) with average nitrate concentration was 3.46 mg/L and average DO concentration 1.52 mg/L.

https://doi.org/10.1088/1755-1315/91/1/012004

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Evaluation of Aesthetic Function and Thermal Modification of Vertical Greenery at Bogor City, Indonesia

B Sulistyantara and R Sesara

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Bogor city currently develops vertical greenery due to counter the decreasing of green space quantity. Vertical greenery is a planting method using vertical structure similar to retaining walls. There are some benefits of vertical greenery, such as providing aesthetics value of the landscape, to protect from the heat, to reduce noise, and to reduce pollution. The purpose of this study were to identify thermal modification by vertical greenery in Bogor city, to assess the aesthetics value from vertical greenery, and to provide a recommendation in attempt to manage and improve the quality of vertical greenery in Bogor city. The study was conducted using Scenic Beauty Estimation method, and was done by providing questionnaires to the respondents in order to assess the aesthetics value of vertical greenery. Infrared thermometer was also used to measure the surface's temperature to evaluate thermal modification function of the vertical greenery. The result of study proved that vertical greenery in the Bogor city has considerably good aesthetic. It also showed that there is a decreasing in surface temperature of the vertical greenery structure.

https://doi.org/10.1088/1755-1315/91/1/012005

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Productive Urban Landscape In Developing Home Garden In Yogyakarta City

S N R Irwan and A Sarwadi

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Home garden is one type of agroecosystem that supports ecosystem services even in the urban settlement. The studies involved literature references and field survey along with a framework of the productive urban landscape that support ecosystem services in home garden. Productive urban landscape provided environmentally, socially and economically benefits that contained in ecosystem services. Problems on limited space in the urban settlement have to be managed by modified home garden system in order to work for ecosystem service in developing productive landscape. This study aimed to assess home garden (Pekarangan) system in a cluster of high density settlement in Yogyakarta City. Structured interview and vegetation identification of home garden have been conducted on 80 samples in Rejowinangun Kotagede District, Yogyakarta City. People showed enthusiasm in ecosystem services provided by home garden "Pekarangan Produktif" through developing productive urban landscape. Some benefits on ecosystem services of home garden were revealed on this study consisted of food production for sale (4.7%), home industry (7.69%), aesthetics (22.65%), food (14.10%), biodiversity (10.68%), ecosystem (12.82%), education (2.56), social interaction (11.54%), recreation (4.70%), and others (8.55%). Nevertheless, vegetation and other elements of home gardens have been managed irregularly and in particularly, the planned home gardens were only 17.07%. Actually, home gardens provided a large set of ecosystem services including being cultural services those are the category most valued. The urban people almost hided the understanding of the cultural benefit of ecosystem services of home garden, even though Yogyakarta has known the cultural city. Thus, urban home garden, as way as "Pekarangan Produktif" in the limited space that managed and planned sustainably, provide many benefits of ecosystem services in a productive urban landscape.

https://doi.org/10.1088/1755-1315/91/1/012006

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Correlation of Carbon Stock and Biodiversity Index at the Small Scale Agroforestry Landscape in Ciliwung Watershed

M B S Choliq and R L Kaswanto

Pekarangan is part of a complex of small-scale agroforestry landscape. Pekarangan have 3 functions i.e. ecological, economic, and social. ecological function, for providing landscape services such as carbon stock and biodiversity; economic function, can supplies foods and nutrition; and social function, for building low carbon communities and increasing the environmental awareness. Therefore, this research aims to correlate carbon stocks and biodiversity index of *Pekarangan* in Ciliwung Watershed. This study has measured 48 samples which were divided in three stream, namely upstream, midstream, and downstream. The samples were divided into four groups, G1 (*pekarangan* size less than 120 m^2 and doesn't have other agricultural land (no other agricultural land - OAL), G2 (<120 m^2 with OAL < 1000 m^2), G3 (120-400 m^2 with no OAL) and G4 (120-400 m^2 with OAL < 1000 m^2). The results show that correlation between carbon stock and biodiversity index value is $R^2 = 0.05$. The results showed no correlation between carbon stocks and biodiversity index could be due to the amount of *Pekarangan* owners who prefer potted plants than plant a tree, so that the carbon sequestered in the Pekarangan only slightly.

https://doi.org/10.1088/1755-1315/91/1/012007

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Identification of Potential Wild Herbal as parts of Landscape Elements

Bambang Sulistyantara and Nio Mentari

Many landscape plants can grow on their own without cultivated by humans. They are type of plants that can be found anywhere, so they can be categorized as wild plants. The economic value of wild plants are easy to obtain and their maintenance costs are low. Because wild plants not widely known even a just a few of people that aware of their existence, it is necessary to do a study to learn the potential of the wild plants to be used as an element of landscape. This research aims to identify the species that have potential to be used in landscape design, to describe the benefits of the their implementation as a landscape element, and to recommend the wild plants that have functional value and visual. This research used a scoring method based on the functional and visual criteria, and questionnaires were conducted to 50 students of Landscape Architecture IPB who have completed Landscape Plants courses. Based on the research, there are 150 species of wild plants that found in the study site, and 60 of them are recommended as landscape elements. Then all of the species were arranged as a recommendations book so they can be used as alternative landscape plants.

https://doi.org/10.1088/1755-1315/91/1/012008

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The Influence of Vegetation Function towards the Langsep Street Thermal Comfort

R Alfian, I Setyabudi and R S Uran

Streetscape is an important element for character building of the environment, spatial, and visual in order to provide an urban identity, especially in Malang City protocol streets. Langsep Street is one of the protocol streets in Malang City. Langsep Street famous with central education and offices area. This study aims (1) to identify vegetation of streetscape; (2) to analyze the thermal comfort of the

streetscape, and (3) to evaluate the comfort level of Langsep Street. The method used was the THI approach. THI value that obtained was analyzed using the standard of Laurie (1990). Based on observations, the THI value of Langsep Street was 27.60. This was influenced by the trees canopy density and spacing of the trees on the streetscape. It can be concluded that streetscape required (1) shaded plants that have root systems that do not damage the construction of roads, (2) the branching plants are not easily broken and easy to maintain, and (3) the combination of trees, shrubs and ground cover.

https://doi.org/10.1088/1755-1315/91/1/012009

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Diversity and Utilization of Bamboo Plants in The Area of Hotel in Kedewatan Village, Ubud, Bali

N W F Utami and N L M Pradnyawathi

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Bamboo or *tiying* (Balinese language) is a widely used non-timber plant in Indonesia especially in Bali. The presence of bamboo appertains to its ethno-botanical function of bamboo especially for rituals. However, there are other utilization of bamboo which is naturally grown or intentionally planted. Kedewatan as a famous place in northern Ubud, Bali have many lavish hotels with its natural environment and appealing place. The aims of this study is to invent bamboo species diversity and bamboo utilization on private areas of hotel in Kedewatan. Methods used in this study was field survey with observation and interview technic. Observation was implemented by purposive sampling methods by selecting hotel which adjacent to Ayung and Wos rivers. Interview was conducted with some key persons in charge on managing hotel garden. In addition, bamboo species identification was established through literature study. The results show that there are eleven bamboo species found on the survey area with most commonly employed species in the area were *tiying tali* (*Gigantochloa apus* (J.A. & J.H. Schultes) Kurz.) and *tiying gading* (*Phyllostachys sulphurea* (Carr.) A. e.t. C. Riv.) which were belong to exotic species. The areas which bamboo cultivated were welcome area as a hedgerow and near hotel lobby, between, outside and inside villa buildings, and naturally grown in the riverbanks with a good landscaping arrangement. Bamboo plantations were utilized to adorn and support the quality of the hotel building as well as to conserve soil and water along Ayung and Wos river canyons. The other utilization of bamboo was to facilitate ritual activity in Kedewatan village. They are allowed to ask for limited amount of bamboo culms with condition not to damage the physical appearance and function that desired by the hotel manager or hotel owner.

https://doi.org/10.1088/1755-1315/91/1/012010

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Comfort Evaluation of Some City Parks in Menteng Subdistrict Using Grid Method

P T Putra and N Nasrullah

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This article aims to evaluate the thermal comfort in three parks at Menteng Sub District, Central Jakarta. The method used in this research is grid method that mapped the parks into squares. Grid method indicated the spread of temperature and humidity value with the canopy coverage. This study purposed to identify the distribution of temperature and humidity in Menteng Park, Suropati Park, and Situ Lembang Park. From the results, the highest temperature was in Menteng Park

indicated by the average value of temperature is 35.6°C compared with Situ Lembang Park (34.7°C) and Suropati Park (34.3°C). The highest humidity was in Suropati Park indicated by the average value of humidity was 52.6% compared with Menteng Park (50.5%) and Situ Lembang Park (48.2%).

https://doi.org/10.1088/1755-1315/91/1/012011

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Evaluation of roadside greenbelt trees damage caused by strangler plants in Bogor

Dibyanti Danniswari and Nizar Nasrullah

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Certain plants are called stranglers (hemiepiphyte) because they grow on host trees and slowly choking the host, which often results in the host's death. The existence of strangler plants on roadside greenbelt trees is quite common in Bogor, but they may cause tree's failure and threaten users' safety. To prevent such hazard, evaluation of roadside greenbelt trees damage caused by strangler plants is important. This study was directed to analyse the vegetation of strangler plants in Bogor, to assess the damage caused by stranglers, and to compose strangled trees maintenance recommendations. This study was conducted in March to May 2014 by doing survey at five major roads in Bogor, which were Jalan Ahmad Yani, Jalan Sudirman, Jalan Pemuda, Jalan Semeru, and Jalan Juanda. The results showed that strangler species found in Bogor are *Ficus benjamina, Ficus glauca, Ficus elastica*, and *Schefflera actinophylla.* The most common species in Bogor is *F. benjamina.* Host trees that tend to be preferred by strangler plants are trees with large trunk, many branches, and medium to high height. The maintenance for every strangled tree is different according to the damage level, mild to severe damage could be treated by strangler root cutting to tree logging, respectively.

https://doi.org/10.1088/1755-1315/91/1/012012

Socio-Economic Cultural Landscape

OPEN ACCESS

Converging social classes through humanized urban edges

M V Abuan and Z D Galingan

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Urban open spaces are created to be used by people. It is a place of convergence and social activity. However, these places have transformed into places of divergence. When spaces become dehumanized, it separates social classes. As a result, underused spaces contribute to urban decay. Particularly an urban edge, the JP Rizal Makati Waterfront Area is the center of this paper. The JP Rizal Makati Waterfront Area is a waterfront development situated along the banks of one of Metro Manila's major water thoroughfare --- Pasig River. The park and its physical form, urban design and landscape tend to deteriorate over time --- creating a further division of social convergence. Social hostility, crime, negligent maintenance and poor urban design are contributing factors to this sprawling decay in what used to be spaces of bringing people together. Amidst attempts to beautify and renew this portion of Makati City's edge, the urban area still remains misspent.This paper attempts to re-humanize the waterfront development. It uses the responsive environment design principles to be able to achieve this goal.

https://doi.org/10.1088/1755-1315/91/1/012013

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Stakeholders analysis on criteria for protected areas management categories in Peninsular Malaysia

Z Hashim, S A Abdullah and S Md. Nor

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The establishment of protected areas has always been associated with a strategy to conserve biodiversity. A well-managed protected areas not only protect the ecosystem and threatened species but also provides benefits to the public. These indeed require sound management practices through the application of protected areas management categories which can be is seen as tools for planning, establishment and administration of protected areas as well as to regulate the activities in the protected areas. However, in Peninsular Malaysia the implementation of the protected areas management categories was carried out based on the '*ad-hoc*' basis without realising the important of the criteria based on the local values. Thus, an investigation has been sought to establish the criteria used in application to the protected areas management categories in Peninsular Malaysia. The outcomes revealed the significant of social, environment and economic criteria in establishing the protected area management categories in Peninsular Malaysia.

https://doi.org/10.1088/1755-1315/91/1/012014

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User Satisfaction Assessment To Edu-Eco Tourism Services Of Cibodas Botanical Garden

I W Hidayat and Winarni

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Cibodas Botanical Garden (CBG) is a government institution which has principal duties and functions as area of conservation *ex situ* of wet highland plants, research, education and tourism, it very closely related to aspect of the services to user. Good services will support the sustainability and existence of CBG as a world class edu-eco tourism destination. The purpose of this study was to measure the quality of services which delivered and improvement which necessary at the future. Assessments were made based on 14 criteria of services aspect for user which need research-education services and regular tourism services activities. The study was conducted by distributing questionnaires to users of these services. Questionnaires distribution was conducted in early August 2015 and August 2016, the respondents were 124 and 207. The results were showed the user satisfaction at good level, there were 77.685 in 2015 and 72.08 in 2016. Although still at a good level, there were a decline in satisfaction levels based on the value. In the future, the managerial needs to continuously to improve it, in order to get a good or very good valuation.

https://doi.org/10.1088/1755-1315/91/1/012015

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Identifying the characteristic of *SundaParahiyangan* landscape for a model of sustainable agricultural landscape

M Z Dahlan, H S A Nurhayati and W Q Mugnisjah

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This study was an explorative study of the various forms of traditional ecological knowledge (TEK) of Sundanese people in the context of sustainable agriculture. The qualitative method was used to identify *SundaParahiyangan* landscape by using Rapid Participatory Rural Appraisal throughsemi-structured interviews, focus group discussions, and field survey. The Landscape Characteristic Assessment and Community Sustainability Assessment were used to analyze the characteristic of landscape to achieve the sustainable agricultural landscape criteria proposed by US Department of Agriculture. The results revealed that the *SundaParahiyangan* agricultural landscape has a unique characteristic as a result of the long-term adaptation of agricultural society to theirlandscape through a learning process for generations. In general, this character was reflected in the typical of Sundanese's agroecosystems such as forest garden, mixed garden, paddy field, and home garden. In addition, concept of *kabuyutan* is one of the TEKs related to understanding and utilization of landscape has been adapted on revitalizing the role of landscape surrounding the agroecosystem as the buffer zone by calculating and designating protected areas. To support the sustainability of production area, integrated practices of agroforestry with low-external-input and sustainable agriculture (LEISA) system can be applied in utilizing and managing agricultural resources.

https://doi.org/10.1088/1755-1315/91/1/012016

OPEN ACCESS

Analysis of Green Space Characteristic Effect to the Comfort Microclimate in the Simple Flats in Jakarta

Nenah Suminah, Bambang Sulistyantara and Tati Budiarti

− Hide abstract PDF

Existence of green spaces on simple flats (Rusunawa), especially trees, greatly affect the ambient temperature outside and inside the building. Density of tree canopy can modify air temperature under trees or buildings by reducing solar radiation on building facade. The aims of this study is to analize the characteristics of green space in Rusunawa and its influence on the microclimate. The experiment was conducted at four Rusunawa building located in Jakarta, i.e. Rusunawa Jatirawasari, Tambora, Pulogebang, and Marunda Cluster A. Species and number of trees were identified, while the ground cover was identified by its species and coverage. Physical characteristics of trees were measured by tree thrunk, tree height, and width crown. Measurement of temperature, relative humidity (RH), and wind velocity was conducted at seven points in each Rusunawa to determine their effects. The results showed the presence of trees can modify the temperature of building outside similar with in the building. The decrease of temperature was influenced by green coverage area, green coverage index, and environmental condition around Simple flats. In this study, the best microclimate was modification by the ability to reduce largest temperature differences. Further more, green space in Rusunawa Marunda Cluster A was considered as the most effective one in reducing temperature.

https://doi.org/10.1088/1755-1315/91/1/012017

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Identification Of Minangkabau Landscape Characters

M Asrina, A Gunawan and Munandar Aris

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Minangkabau is one of cultures in indonesia which occupies landscape intact. Landscape of Minangkabau have a very close relationship with the culture of the people. Uniqueness of Minangkabau culture and landscape forming an inseparable characterunity. The landscape is necessarily identified to know the inherent landscape characters. The objective of this study was to identify the character of the Minangkabau landscape characterizes its uniqueness. The study was conducted by using descriptive method comprised literature review and field observasion. Observed the landscape characters comprised two main features, they were major and minor features. Indetification of the features was conducted in two original areas (darek) of the Minangkabau traditional society. The research results showed that major features or natural features of the landscape were predominantly landform, landcover, and hidrology. All luhak (districts) of Minangkabau showed similar main features such as hill, canyon, lake, valley, and forest. The existence of natural features such as hills, canyon and valleys characterizes the nature of minangkabau landscape. Minor features formed by Minangkabau cultural society were agricultural land and settlement. Rumah gadang (big house) is one of famous minor features characterizes the Minangkabau culture. In addition, several historical artefacts of building and others structure may strengthen uniqueness of the Minangkabau landscape character, such as The royal palace, inscription, and tunnels.

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OPEN ACCESS

Local Knowledge About The Structure, Function And Conversion Of Landscape In The Karangwangi Village, Cianjur, West Java, Indonesia

Fatiya Ulfa Dwi Amelia and Johan Iskandar

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Karangwangi people is one of indigenous people in West Java who has local knowledge about their nature thoroughly. They have local tradition about landscape ecosystem arrangement that based on *sakral* (sacred) norm. With this rule, local people will always try to preserve the sustainability of their natural environment. However, modernization, increasing population, decreasing forest, and increasing market economic penetration, causing this rule and structure of landscape in Karangwangi village has changed. Land conversion in Karangwangi was occur because of settlement and land investment by people outside the village. These behavior changes in tradition and landscape (structure, function and conversion) in Karangwangi may impact on their daily activities, and so do the changes in daily activities can change their behavior in tradition and landscape. This research was undertaken in the Village of Karangwangi, Sub-district of Cidaun, District of Cianjur, Province of West Java, Indonesia. This paper aims to identify how indigenous people in Karangwangi understand kinds of landscape and another conversion that was happen as a result of management. The method used in this paper is qualitative with ethno ecological approach. The resulted of the study show that local people in Karangwangi Village understand how chronological of landscape structure, function and conversion.

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OPEN ACCESS

Landscape Management of Public Open Space in Bogor Heritage City

F D Pusparini, Nurhayati and H S Arifin

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Public open space landscape plays important role in Bogor Heritage City. Although these spaces can carry various kind of public activities and enhance environment quality, they are fragile to disturbance and changing due to city development. Therefore, as an effort to maintain public open space landscape in 8 zones within Heritage City of Bogor, management of public open space landscape is necessary. Syntesys of public open space landscape management had held by using Analytical Hierarchy Process (AHP). The AHP result showed public open space landscape in Palace and Botanical Garden of Bogor zone (20%) is in high priority to be maintained. The other zone are Situ Gede (16,9%), Plan Karsten (12,3%), European Settlement (12%), Suryakencana (11,2%), Batu Tulis (10,2%), Empang (9.2%) and West Development (8,2%). Ecological function (34,8%) becomes the most important function to be maintained (34.8%) then social culture (31.2%), economic (17%), and aesthetics (17%).

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OPEN ACCESS

Study on Ecological Design Concept of Buton Sultanate Cityscape Based on Local Culture

A Mansyur, A Gunawan and A Munandar

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Buton Sultanate Cityscape was constituted of man-made landscape constructed in the era of Buton Sultanate in 1322. It is one of the Indonesian heritage networks proposed to be the world heritage city. The Sultanate cityscape should have the concept of traditional city and refer to the ecological principles. This research was conducted to analyze elements and spatial patterns of Sultanate cityscape based on the ecological principles (eco-design). Descriptive method was utilized in the research by conducting in-depth interviews with the local custom figures and experts of the local culture, literature reviews, and field observations. The main elements of Buton Sultanate Cityscape consisted of palaces, city square, mosque, cemeteries, and settlements, while the supporting elements located outside the city border include mountains, valleys, rivers, and forests. City square is located in the city center surrounded by the palace, cemetery, and mosque. The main pattern of city circulation pattern has formed a simple figure of human body. Ecological principles can be examined from the housing layout paralleled to the road, direction of most city gates facing the east and forests, and the city wall pattern which is closely related to the religious matter.

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Taneyan Lanjhang, Study of Home Garden Design Based Local Culture of Madura

R T Maningtyas and A Gunawan

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This research aims to study the arrangement of landscape elements in Madura home garden and the underlying philosophy of the existence of these elements to formulate a concept of Madura home garden in accordance with the culture. Data about traditional culture, the character of the community, and the arrangement of the landscape around the home garden obtained through library research, field observation, and interviews of certain resource persons through purposive sampling techniques. The results showed that the Madura developed a pattern of home garden arrangement

called *taneyan lanjhang*. Each taneyan lanjhang at least consist of several elements, *namely langghar, roma, dapor, kandhang, taneyan,* and organic fences. The elements are placed in a certain position in the direction of east-west and north-south by the Madura concept of life *bappa-babbhu-guru-rato* (father-mother-teacher-queen). The concept proposed residential garden is a garden house that is functional and aesthetic. This concept *taneyan lanjhang* split into five space, which is a public space, private space, semi-public spaces, room service, and a buffer space. The concept of circulation in taneyan lanjhang made according to the axis pattern that directs entrance to the *langghar* (prayer room) as a focal point.

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OPEN ACCESS

Community Movement in Applying Mosquito Net on House Ventilations: An Initial Support for Green Architecture to Decrease Dengue Disease in Bandung Indonesia

F R Rinawan, I P P Dewi, G Z Haifa, K D Suharno, K Oktavinus and P S Lyn

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Green architecture still has risk to dengue disease when trees cover house roofs' gutter. This study was aimed to continue a geographical information system (GIS) and remote sensing (RS) study on roofs factor association with dengue disease by initiating community movement in applyingmosquito net on house ventilations to cut the disease transmission and mosquito breeding sites inside house. Our methods was an operational research in which improvement of interventions, policies and regulations towards dengue disease prevention is our intended endpoint. Several steps were conducted such as: (1) research problems formulation from GIS-RS analysis from previous phase research in Bandung city, (2) informal and formal approach to community leaders and primary healthcare centre (Puskesmas), (3) Video education and focus group discussion (FGD), (4) initial application of mosquito nets on house in communities; and (5) advocacy to Mayor of Bandung city (was on progress).Our study resulted several supports: one of sub-city leaders (Camat) in the city, village leaders (Lurah), and sub-village leaders (Ketua RW) of 5 villages (kelurahan), one kelurahan which mainly comprised formal settlements needed more efforts, which was experts on dengue disease from university to directly explain the mosquito nets application to its community. Informal leaders in all kelurahan's community suggested only mothers movement was not enough, thus, youths in community was mentioned to help the community movement on the mosquito nets application.

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Study Of Lampungnese Traditional Home Garden Design

R A Pratiwi and Gunawan

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Lampung is one area in Indonesia which has a traditional culture that comes from two groups of descents, they are ulun Lampung Pepadun and ulun Lampung Saibatin. Lampungnese traditional culture has been well-known by Indonesian people for its traditional dances, traditional clothing, or traditional home architecture. However, Lampungnese traditional home garden recently may not yet been described. Information related to Lampungnese traditional home garden is still very limited

and it does not yet represented the culture based design concept. This research was directed to identify the elements of the home garden and map it into design concept of the Lampungnese traditional home garden based on information of Lampungnese traditional culture. The study was conducted by using descriptive approach through literature review, interviews and cultural exploration, as well as field observation. The study was able to identify the elements forming the Lampungnese traditional home garden, namely *gakhang hadap, walai,* outdoor kitchenette, firewood place, outdoor kitchen, livestock barns, as well as plants. Space layout of the home garden comprises front yard (*tengahbah/terambah/beruan*), side yard (*kebik/kakebik*), and backyard (*kudan/juyu/kebon*). Each element of the garden is located in the right place of the space layout.

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Landscape Design and Planning

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Fitness Parks: A Comparative Study of the Components of Jakarta-Manila Parks and their Responsiveness to Support Physical Activities

Franklin S. Fontanoza Jr., Nappy L. Navarra and D. Engg

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Fitness has become more popular due to the cultural phenomenon that being fit can enhance one's perception of beauty. The sprouting of various outlets for physical activity such as bodybuilding gyms that cater to weightlifting, outdoor group dance classes, sports camps and cause-oriented marathons can be noticed in numerous parts of the world. But slowly its concept, that being fit is a mere physical representation of beauty, is shifting into a more health-oriented consciousness. Annual reports have shown that coronary heart disease is still in the top rank of the death causes in the world. This information has led more people to protect their health through several lifestyle improvements, with regular exercise being one of these methods to achieve health goals. Its numerous benefits range from the lowering of blood pressure, heightened learning capacity to the improvement of mood. The health-rooted awareness of the need for physical activities to support one's daily requirement has spread worldwide and has now been recognized by a lot of people.

Parks are usually designed with amenities such as playgrounds, pathways and wide open spaces where people from all walks of life convene, interact with each other and do various physical activities. With this in mind, the capacity of parks to host such activities has to be studied to determine which components do people who engage in active healthy lifestyles find highly attractive and usable. An analysis of such could lead to effective space programming of our local neighborhood parks making it more perceptive to the physical needs of the people. Two major sports complexes from South East Asia have been used as case studies to assess the responsiveness of the locals to the amenities offered in each complex to address health goals. The comparison revealed that the Gelora Bung Karno Complex in Jakarta, Indonesia has more activity-oriented amenities and longer operating hours, making it more receptive to meet the physical activity requirement.

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OPEN ACCESS

Identifying Creative Urban Landscape Towards Creative Tourism in Bandung: *A Preliminary Study*

F Sinatra, Kurniasih and Indradjati

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This article discusses about creative urban landscape towards creative tourism in Bandung. The objectives of this study are to identify and organize strategic plans to promote creative cluster and creative tourism. Three dimensions of creative space that are studied in this research are creative software landscape, creative hardware landscape, orgware. The results of this study suggests that creative spaces in Bandung need to reformulate creative clusters as some of the creative clusters have creative enclaves or sub creative clusters. There are eight main clusters and eighteen enclave clusters with each main and enclave clusters supported by creative software and hardware landscape. Both the creative software landscape and creative hardware landscape are designed to stem from the cluster theme to enhance tourists' experiences.

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OPEN ACCESS

Places of Faith: A Reflection on Landscape of Manila Cathedral Plaza de Roma and Istiqlal Mosque Sacred Grounds of Jakarta

MM Pujalte and N Navarra

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Crossing boundaries of faith from Manila to Jakarta, this study is to classify the open spaces in their sacred grounds according to its characteristics, elements, use of space and hierarchy of importance in landscape design approach. The reflection of their religious landscape in preserving the traditional, and exploring the non-traditional aspect of their landscape design in global setting is carried out thru a spatial analysis for Plaza de Roma of Manila Cathedral and the sacred grounds of Istiqlal Mosque. The design framework would tackle: concepts, planning approach, functional symbolic values, and aesthetics used. The data and information are all examined based on observation, historical background, analyses, and literature content in determining spatial functions. Finally, when results are completed, this will give a better understanding on the importance of open areas in Manila and Jakarta's sacred spaces; paving way for a better sense of comfort in spiritual contemplation. This will also help reveal the commonalities in spiritual practices between Islam and Christianity, and the role of landscape in their religion and faith.

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Landscape Character of Pongkor Mining Ecotourism Area

A Kusumoarto, A Gunawan, Machfud and A Hikmat

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Pongkor Mining Ecotourism Area has a diverse landscape character as a potential landscape resources for the development of ecotourism destination. This area is part of the Mount of Botol Resort, Halimun Salak National Park (HSNP). This area also has a fairly high biodiversity. This study aims to identify and analysis the category of landscape character in the Pongkor Mining Ecotourism Area for the development of ecotourism destination. This study used a descriptive approach through field surveys and interviews, was carried out through two steps : 1) identify the landscape character, and 2) analysis of the landscape character. The results showed that in areas set aside for ecotourism

destination in Pongkor Mining, landscape character category scattered forests, tailing ponds, river, plain, and the built environment. The Category of landscape character most dominant scattered in the area is forest, here is the river, plain, tailing ponds, the built environment, and plain. The landscape character in a natural environment most preferred for ecotourism activities. The landscape character that spread in the natural environment and the built environment is a potential that must be protected and modified such as elimination of incongruous element, accentuation of natural form, alteration of the natural form, intensification and enhanced visual quality intensively to be developed as a ecotourism destination area.

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Landscape Potential Analysis for Ecotourism Destination in the Resort Ii Salak Mountain, Halimun-Salak National Park

A Kusumoarto, A Gunawan and G R Nurazizah

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The Resort II *Salak* Mountain has variety of landscape potential for created as ecotourism destination, especially the potential of the waterfall (*curug*) and sulphur crater (*Kawah Ratu*). The aim of this study was to identify and analyze the potential resources of the landscape to be created as ecotourism destination, Resort II *Salak* Mountain. This research was conducted through two phases: 1) identification of the attractions location that have potential resources for ecotourism destination, and 2) analysis of the level of potential resource of the landscape in each location using Analysis of Tourist Attraction Operational Destination (ATAOD). The study showed Resort II *Salak* Mountain has many ecotourism objects which have been used for ecotourism activities, such as hot spring baths, *Curug Cigamea, Curug Ngumpet, Curug Seribu, Curug Pangeran, Curug Muara, Curug Cihurang, Kawah Ratu,* camping ground, *Curug Kondang* and *Curug Alami.* The location of all waterfalls –*curug,* spread widely in the core zone for ecotourism. In the other hand, camping ground is located in the business zone, while *Kawah Ratu* is located in the natural forest, which is included in the buffer zone of Halimun-Salak National Park (HSNP). The result showed that the ecotourism objects with the highest potential value are *Kawah Ratu, Curug Seribu, Curug Muara, Curug Kondang* and *Curug Ngumpet*.

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Promoting Productive Urban Green Open Space Towards Food Security: *Case Study Taman Sari, Bandung*

M. Ridwan, Fran Sinatra and Petrus Natalivan

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The common trend of urban population has been growing significantly in Indonesia for decades, are affected by urban green space conversion. Generally, this area is utilized for urban infrastructures and residences. Furthermore, urban area has grown uncontrollably that could enhance the phenomenon of urban sprawl. The conversion of green urban area and agricultural area will significantly decrease urban food security and quality of urban environment. This problem becomes a serious issue for urban sustainability. Bandung is a city with dense population where there are

many poor inhabitants. Families living in poverty are subjected to food insecurity caused by the rise of food prices. Based on the urgency of urban food security and urban environment quality the local government has to achieve comprehensive solutions. This research aims to formulate the policy of productive green open space towards food security for poor people in Bandung. This research not only examines the role played by productive green open space to supply food for the urban poor but also how to govern urban areas sustainably and ensure food security. This research uses descriptive explanatory methodology that describes and explains how to generate policy and strategic planning for edible landscape to promote urban food security. Taman Sari is the location of this research, this area is a populous area that has amount of poor people and has a quite worse quality of urban environment. This study shows that urban green open space has the potential to be utilized as an urban farming land, which poor inhabitants could be main actors to manage urban agriculture to provide their food. Meanwhile, local government could contribute to subsidize the financial of urban farming activities.

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Landscape Characteristics of Oriental Honey Buzzards Wintering in Western Part of Flores Island Based on Satellite-Tracking Data

Syartinilia, G H Al Farisi and H Higuchi

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Oriental Honey Buzzards (OHBs, *Pernis ptilorhynchus*) are migratory raptor that has been satellite-tracked since 2003. Some islands in Indonesia which are used for wintering habitat are Flores and Borneo. However, both islands have different characteristics of climate and land cover. The objectives of this research were to analyze the landscape characteristic of the OHBs wintering habitat in western Flores, and to subsequently compare landscape characteristic of the OHBs wintering habitat in Borneo. Landscape habitat characteristics were analyzed using Principal Component Analysis (PCA) combined with GIS and then compared to the previous study in Borneo Island. The result showed that the first of six principal components explained 79.14% and 77.59% of the observed variation in landscape characteristics of both core and edge habitats, subsequently. Habitat selection by OHBs at wintering site was influenced by the availability of thermal wind and food. Savannah was identified as the main landscape characteristic that was different between wintering habitat in Flores and Borneo. Savannah is well-known as a habitat for many species of amphibians, reptiles, and small mammals so that it can be a hunting area that provide alternative feed for OHBs.

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Ecological Design of Fernery based on Bioregion Classification System in Ecopark Cibinong Science Center Botanic Gardens, Indonesia

S Nafar and A Gunawan

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Indonesia as mega biodiversity country has a wide variety of ferns. However, the natural habitats of ferns are currently degrading, particularly in lowlands due to the increasing level of urban-sprawl and industrial zones development. Therefore, Ecology Park (Ecopark) Cibinong Science Center-

Botanic Gardens as an ex-situ conservation area is expected to be the best location to conserve the lowland ferns. The purpose of this study is to design a fernery through an ecological landscape design process. The main concept is The Journey of Fern, this concept aiming on providing users experiences in fernery by associating conservational, educational, and recreational aspects. Ecological landscape design as general is applied by the principal of reduce, reuse, and recycle (3R). Bioregion classification system is applied by grouping the plants based on the characteristics of light, water, soil, air, and temperature. The design concept is inspired by the morphology of fern and its growth patterns which is transformed into organic and geometric forms. The result of this study is a design of fernery which consist of welcome area, recreation area, service area, and conservation education area as the main area that providing 66 species of ferns.

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OPEN ACCESS

Riparian landscape management in the midstream of Ciliwung River as supporting Water Sensitive Cities program with priority of productive landscape

T U Z Noviandi, R L Kaswanto and H S Arifin

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Nowadays, Ciliwung River is facing problem of the settlement occupation in its riparian zones. This phenomenon caused ecological damage in riparian, so it can aggravate the disaster of annual flooding in Jakarta. As an effort to control this catastrophe, riparian landscape management of Ciliwung River is needed. Based on its topography, Ciliwung River is divided into three segments, there are the upstream, the midstream, and the downstream. Data shows that riparian in the midstream is the largest area, it covers more than 60% of the total riparian area. This segment is very important to be managed in order to reduce runoff towards the downstream. The method used was comparing many standards to get the ideal riparian width in the midstream, which is 50 m for urban areas and 100 m for outside the urban areas. Next method was analyzing spatially to get riparian landscape characteristic of Ciliwung River. The result showed that 37.11% of riparian zones in the midstream had occupied by settlement. Analysis of riparian function and utilization had held by using Analytical Hierarchy Process. Priority of riparian function in the midstream of Ciliwung River is production. This can be realized with the plan of community garden or inland fisheries. Riparian landscape management in the midstream aims to support the food consumption diversification, and maximize the function of water catchment and water retention in order to support the program of Water Sensitive Cities.

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OPEN ACCESS

The Concept of Historical Landscape Design at Watugong Archaeological Site Area in Malang City

I Setyabudi, R Alfian and W R Hastutiningtyas

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Malang city has the high historical value. It showed by many archaeological situses found, such as: The Dutch Colonial Building until kingdom era on classical history period. Generally, it could be seen at urban affairs like government building even the ancient house. But the last kingdom archaeological site only found at the village. The oldest archaeological site in Malang city was found

on Kanjuruhan Kingdom, which is concentrated in Tlogomas. The Watu Gong Hamlet that was located in Tlogomas Political District had an archaeological site. It was a big stone in which the stone looked like a traditional music instrument, it was called Gong. As the archaeological site in megalithicum, before the Hindu and Budha came in from India, that stone was predicted as the foundation structure of the big building. The Watu Gong Hamlet was located in Tlogomas archeological site area, also Merjosari and Karang Besuki. Three of them are the archeological sites for Kanjuruhan Kingdom at eigth century, until Kahuripan Kingdom around the eleventh century, as the heir of the Ancient Mataram Kingdom. The urban government has a program to improve the village required to their region potential and it was possible to revitalize the Tlogomas village, so that the historical character can be seen well. The modernity of a hamlet has impact on the local identity blured. In which, they did not think about economic only and it can be minimized, also the hamlet will be a characterized tourism object. The revitalization purposed to continuing the past, then it's connected to present. It's performed as corridored garden planning. The landscape development appropriated to promote about the characters of Kacapiring flower, Rose, Jasmine and Puring. They are the special plants from Kanjuruhan Kingdom, beside the other furniture street model. This research was descriptive explorative and discussed about the concept with architecture design approach, started from data collecting, precedent study, programming until the developing concept of the historical landscape. The historical landscape concept for Tlogomas at present is recommended to Watu Gong as the village tourism object.

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Landscape Design Process of Lakewood Nava Park BSD City Based on Smart Growth Concept

M Z Islami and R L Kaswanto

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A comfortable and green housing area in a city is a must for the people live in a city. The rapid development in a city caused greater need for land. This problem happens simultaneously with environmental problem globally such as growing number of people, pollution, excessive exploitation of resource, and decreasing in ethic of land uses. The design of Lakewood Nava Park BSD City prioritizes on pedestrian and walkable environment to apprehend those problems. Lakewood Nava Park is a landscape design project conducted by landscape consultant company, Sheils Flynn Asia. The concept of Smart Growth used as a recommendation for Lakewood Nava Park design. Smart Growth is a city planning and transportation theory which expand a city into a walkable city. The method used on this research is a comparison between landscape design process and Booth theory, also analyze ten principle concept of Smart Growth at the project. Generally, the comparison between design process and Booth theory resulted a slight difference in term and separate phase. The analysis result from Smart Growth concept is around 70% has been applied, and the rest 30% applied after the design has been built. By using Smart Growth principle, the purpose of Lakewood Nava Park design can be applied well.

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OPEN ACCESS

Redesign of Denggung Park as Sleman Urban Park based on Local Wisdom in Yogyakarta

I Sanjaya and IS Fatimah

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Sleman Regency is one of the administrative area in Special Region of Yogyakarta Province which has increased the pace of infrastructure development activities that undertaken by the central government affects another surrounding area. The pace of infrastructure development impacts such problems in Sleman Regency such as, increasingly limited public spaces and changes in understanding the value of local wisdom. Sleman Regency has a park located in central government which is Denggung Park. This park has low visitors and less of aesthetic value which require re-design to improve the quality as public space for cultural identity space. The base concept of Urban Park adopted the philosophy that connects to four components in Javanese mythology. The four components in Javanese mythology symbolize the journey of human life in the Javanese cosmological theory, there are Mount Merapi, Keraton, Krapyak Stage, and South seas. The design concept inspired from pattern of Yogyakarta traditional clothing namely, Batik Kawung which describe of Philosophy "Four of Brotherhood and Five of Central itself" by means synergize four items creating world nature and human as life catalyzer. This study uses descriptive and spatial analysis method. The result of this research is expected to be a design recommendation for Sleman Regency governance in the urban park development.

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OPEN ACCESS

Green Campus Study by using 10 UNEP's Green University Toolkit Criteria in IPB Dramaga Campus

Saraswati Sisriany and Indung Sitti Fatimah

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Campus landscape is an important part of campus life, because it is regarded as a physical manifestation of the value of a college. Green campus is a concept to build sustainable living practices that are environmentally friendly in educational institutions around the world, including in IPB Dramaga Campus. The main objective of this study is to identified and analyze IPB Dramaga Campus sustainability used green campus criteria from UNEP (United Nations Environment Programme). The methods stages are data collection, analysis and assessment, and recommendation as the synthesis. All the data analyzed with gap analysis, then it assess with Likert Scale scoring. The results showed that green level of IPB Dramaga Campus is classified as Moderate, with total score 32. The result from each criterias are, Energy, Carbon and Climate Change is Moderate; Water is Not Good; Waste is Moderate; Biodiversity and Ecosystem Services is Very Good; Planning Design & Development is Good; Procurement is Moderate; Green Office is Very Not Good; Green Lab is Moderate; Green IT is Good; and Transport is Good. The Green Level of IPB Dramaga Campus will reach Very Good if these recommendation of strategies applied. The strategies are Green Office, Green Campus Audit, Green Champion, Green Financial Strategies, Water Treatment, Green Lab dan Off Campus Transportation.

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OPEN ACCESS

International tourist preference of Lodok Rice Field natural elements, the cultural rice field from Manggarai – Indonesia

Ray March Syahadat, Priambudi Trie Putra, Nuraini, Balqis Nailufar and Desy Fatmala Makhmud

Lodok Rice Field or usually known as spiderweb rice field is a system of land division. It cultural rice field only found on Manggarai, Province of East Nusa Tenggara, Indonesia. The landscape of Lodok Rice Field was aesthetic and it has big potential for tourism development. The aim of this study was to know the perception of natural elements of Lodok Rice Field landscape that could influence international tourist to visited Lodok Rice Field. If we know the elements that could influenced the international tourist, we could used the landscape image for tourism media promotion. The methods of this study used scenic beauty estimation (SBE) by 85 respondents from 34 countries and Kruskal Wallis H test. The countries grouped by five continents (Asia, America, Europe, Africa, and Oceania). The result showed that the Asian respondents liked the elements of sky, mountain, and the rice field. Then, the other respondent from another continent liked the elements of sunshine, mountain, and the rice field. Although the Asian had different perception about landscape elements of rice field's good view, it's not differ significantly by Kruskal Wallis H test.

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<< Kembali

The Influence of Vegetation Function towards the Langsep Street Thermal Comfort

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Abstract. Streetscape is an important element for character building of the environment, spatial, and visual in order to provide an urban identity, especially in Malang City protocol streets. Langsep Street is one of the protocol streets in Malang City. Langsep Street famous with central education and offices area. This study aims (1) to identify vegetation of streetscape; (2) to analyze the thermal comfort of the streetscape, and (3) to evaluate the comfort level of Langsep Street. The method used was the THI approach. THI value that obtained was analyzed using the standard of Laurie (1990). Based on observations, the THI value of Langsep Street was 27.60. This was influenced by the trees canopy density and spacing of the trees on the streetscape. It can be concluded that streetscape required (1) shaded plants that have root systems that do not damage the construction of roads, (2) the branching plants are not easily broken and easy to maintain, and (3) the combination of trees, shrubs and ground cover.

1. Introduction

Streetscape is the character of the land or walk formed on a neighborhood street, both of which are formed from the natural landscape elements such as the shape and topography of land formed from man-made landscape elements adapted to the conditions of land [2]. Simonds [7] Streetscape was instrumental in establishing the character of the environment, spatial, and visual in order to provide an urban identity.

According to Utterman in Santyo, *et al.* [6], elements that affect the comfort in a pedestrian are: circulation, accessibility, natural style and climate, security, cleanliness and beauty.

Plants in the landscape view of the road serves as a controller, a physical barrier, climate control, erosion control, wildlife habitat, and aesthetics. Distribution and diversity of tree species in a landscape are important for improving the function of vegetation for environmental stability, both biotic and abiotic [1]. According to Laurie (1986) in Rahmiati [5], the standard moisture for human comfort in activities ranging from 40% - 70% with a temperature between 15ºC-27ºC and Hadi *et al* [3], states that the index of comfort in comfortable conditions ideal for man Indonesia in the range of THI (Temperature human Index) with a value of 20-26.

Today most of the streetscape on some streets in Malang City less attention to the physical condition and social landscape of the street, pavement element that dominates, the lack of availability of facilities for the streetscape, as well as the lack of the number, type, and maintenance of the vegetation on the landscape. Maintenance of the type and amount of vegetation on the streetscape is a problem that most influence on the comfort of street users and local residents. The street users are not comfortable for moving because of the street conditions are quite hot and high levels of pollution.
This article will discuss the level of comfort and its evaluation on streetscape on Langsep Street which is one of protocol street in Malang City. The comfort function is one thing that should be available on the landscape so that users can work well. Hence it is important to evaluate the comfort function of a streetscape so it can be analyzed the factors and the comfort level that affect the comfort of the street.

2. Method

The method used in this research was quantitative method with the following technical stages:

2.1 Preparation

The preparation stage was the stage of determining the location and preparation of tools and materials. From this stage determined the location of the research is Langsep Street that is the area of education and office center. The researcher process the permission to Public Works Department and the Department of Hygiene and Park, Malang City.

2.2 Survey

At this stage conducted observation and data collection of air temperature and humidity directly from the field. Data collection was performed by measuring the temperature and humidity at the observation point in distance of 50 meters (Figure 1). Point measurement of temperature and humidity occurs on road safety threshold and median road where there are plants and paving. Data collection was performed three times in one day at 06:00, 12:00, 17:00, for three days. Intake air temperature and humidity data is carried out only when the weather is sunny with using digital termohygrometer.

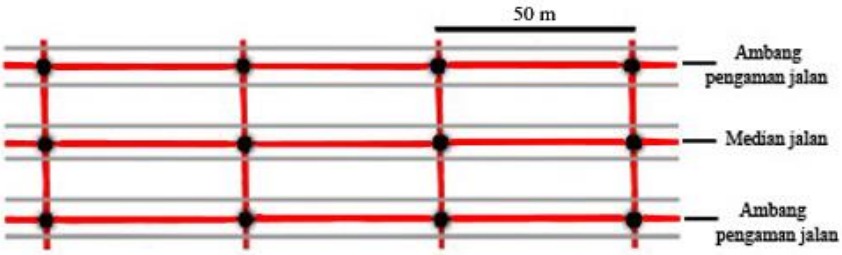

Figure 1 Illustration of observation point temperature and humidity on the streetscape

The size of the street, street structure and land use data obtained from study literature, reports, and standard regulations. The data collection of vegetation and plant spacing obtained from measurement technique, documentation, and collection of existing conditions. The social data of visitors' perception of Langsep Street used the questionnaire from 30 respondents.

2.3 Analysis

The method used in the analysis was the approach of THI comfort index. In this method, the temperature and humidity data was obtained from the measurement results then calculated by the THI formula value;

$$THI = 0{,}8T + (RH \times T)/500$$

THI: *temperature humidity index*
T: temperature (°C)
RH: humidity (%)

THI value obtained was analyzed using the standard of Laurie [4] which states that the ideal environment to have the air temperature 27-28 °C and humidity of 40-75%.

Answers about the purpose and motivation of respondents in each of the paths were analyzed descriptively. A questionnaire containing questions about the data themselves in general respondents (gender, age, education, place of residence), goals, motivations, and perceptions of respondents about the micro-climate comfort. Analysis of the results using chi-square questionnaire to determine the relationship between the answers perception of comfort microclimate street with the factor of gender, place of residence, education, and age of the respondents. Answers about the purpose and motivation of respondents in each park were analyzed descriptively. The results of the questionnaire and the calculation results are analyzed so that it can be used as material comfort evaluation and formulated ways to improve comfort microclimate in each street.

3. Result and Analysis

Langsep Street is one of busy street in Malang City, famous for its central areas of education such as schools and colleges. There are many offices scattered along the Langsep Street. Maintenance of plants on the Langsep street generally suitable with criteria plantings there are sufficiently shade plants on the street. The amount of shade plants on Langsep street enough and planted with appropriate spacing between trees that form a canopy shades helped influence the microclimate. Based on observations of Langsep streetscape have different types of shade trees include mahogany (*Swietenia mahagoni*), and Trembesi (*Samanea saman*).

Langsep street has a length of 1355 meters with an average spacing of trees 8 meters, 6.40 meters of street width, 2.50 meters of pavement width and 3.20 meter of median width. Surrounding Langsep streetscape are very few trees with rarely spacing, so high air circulation. In Alfian [1] stated Vegetation is very useful to manipulate the environment in urban aesthetic, controlling erosion and groundwater, reduce noise, waste water control, traffic control and glare, reduce light reflection, and reduce smell.

3.1 Micro climate Langsep Street

From mapping point observation of the street with a distance of 50 meters gained 27 points of data retrieval air temperature and humidity, based on the observations of temperature and humidity for three days of observation on Highway Langep obtained the following data (Figure 2, 3 and 4).

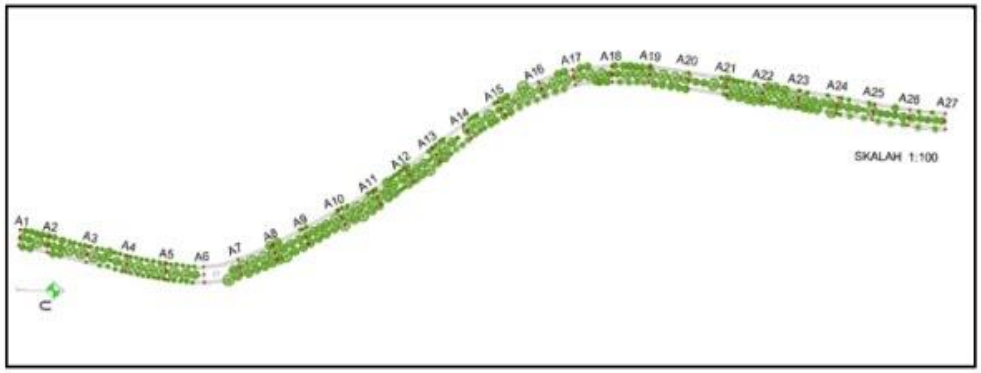

Figure 2. Observation point of temperature and humidity on Langsep Street

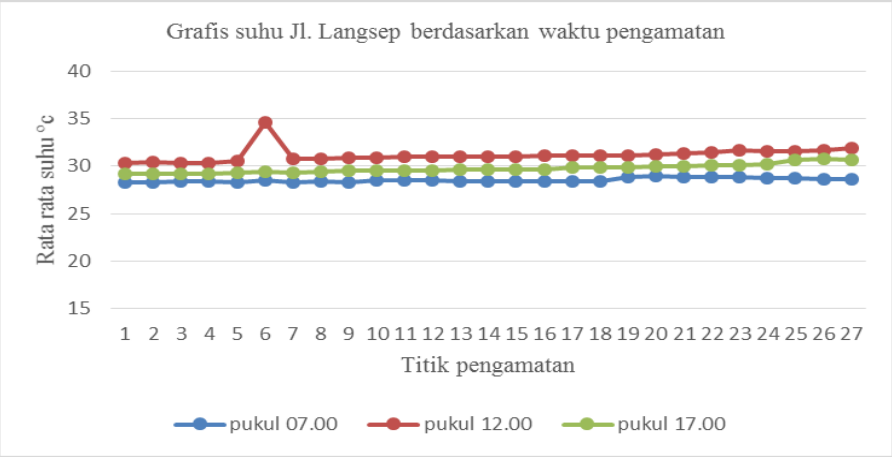

Figure 3. Graph of temperature observations on Langsep Street

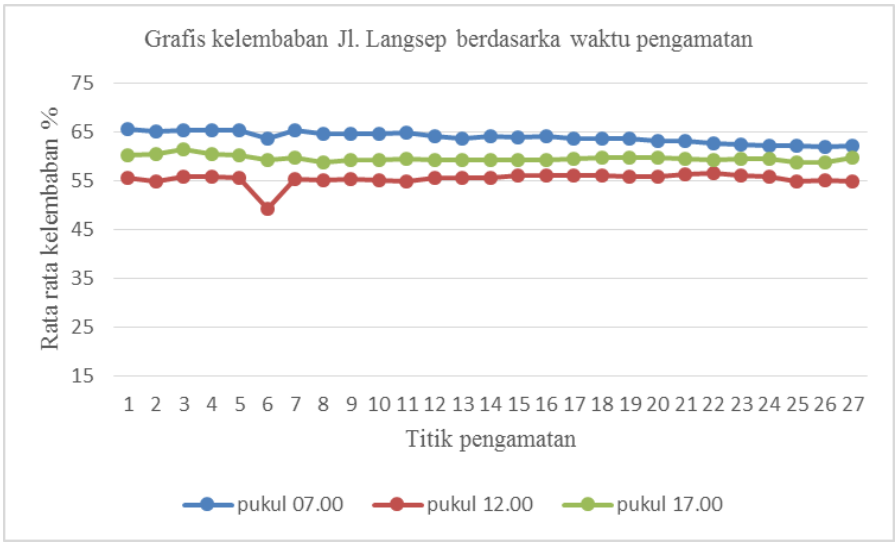

Figure 4. Graph of Humidity observation on Langsep Street

Based on the results of temperature measurements at Langsep street, the highest air temperature is at a point 6 at 12 pm. This point is located close to the intersection area or turn directions, and there is no trees so the air temperature becomes higher because the sunlight received directly in this area. In addition, the region is dominated form of asphalt pavement and road. Humidity value at a point 6 at 12 pm, have a low value because the area is dominated pavement so that direct sunlight reaches the road and cause higher evaporation rates as well as the wind factor that removes moisture evaporation results.

Air temperatures on Langsep street ranged between 28.28 - 34.59 °C with humidity ranged between 49.36 - 67.89%. The landscaping around Langsep street such as schools and shops. Schools and shops are neatly arranged with a shade tree titled big enough. The majority of the vegetation at Langsep street a Trembesi tree (*Samanea saman*) which has a fairly large tree canopy. Heading between trees that touch each pose shade that provides thermal comfort.

3.2. Analysis Humadity Temperature Index (THI) Langsep Street

To find the comfort of air temperature and humidity quantitatively used Temperature Humidity Index (THI). This method uses a factor of air temperature and humidity. The comfort level is a series of conditions on several factors. The results of some of these factors that affect the value of THI. Based on field observations THI value for Langsep street (27.60) with average temperatures ranging from

28.28 - 34.59 °C with humidity ranging between 49.36 - 67.89%. If analyzed according to the standard Laurie[4]. The value of THI at Langsep street out of the standard comfort. THI value by Laurie[4] categorized comfortable is between 21-27, and ideal climate for humans is the air temperature to the value of 27-28 °C and humidity 40-70%.

3.3. Analysis Questionnaire Results Highway langsep.

From the results of questionnaires on Langsep Street obtained street users is 56.67% men and 43.33% women. Street users education is at 13:33% secondary school, 30% high school, 6.67% Academic, 43.33% under graduate school and 6.67 the others.

Hypotheses for comfort relationship with the respondents' gender factor in Langsep Street are as follows:

H_0: Comfort road is not related to gender factor

H_1: There is a relationship between the comfort of roads with gender factor

Chi-table = 3.82

Chi-count = 0.54

Obtained chi-count <Chi-table accept H_0

The calculation is known that the comfort of the road on Langsep Street not related to the gender of street users (Table 1).

Table 1. Comfort respondent data by gender

No	Answer Choice	Gender		
		Man	Woman	Total
1	Comfort	17	10	27
2	Not Comfort	1	2	3
	Total	18	12	30

Table 1 shows that 90% of respondents (27 respondents) feel comfortable with a microclimate Langsep street. The proportion of the perception of comfort in terms of gender is quite comparable. Percentage opinion of a sense of comfort by male respondents was (94%) greater than female respondents (83%).

3.4. Leisure relationship with Respondent Education Factor

Hypotheses for comfort relationship with the respondents' education factor in Highway langsep are as follows:

H_0: Comfort road is not related to educational factors

H_1: There is a relationship between the comfort of roads by a factor of education

Chi-table = 3.82

Chi-count = 2,64

Obtained chi-count <Chi-table accept H_0

The calculation is known that the comfort of the street on Langsep street not related to street user education (Table 2).

Table 2. Data respondent convenience by education.

No	Education level	Comfort	Not Comfort
1	Secondary school	3	1
2	High School	8	1
3	Academic	2	-
4	Undergraduate school	12	1
5	The other	2	-
	Total	27	3

Table 2 shows that the percentage of respondents think that a sense of comfort by junior high school education by (75%) less than high school (89%), Academic (100%), universities (92%), and the others (100%).

4. Conclusion

Termal comfort on Langsep Street influenced by several factors, namely air temperature, humidity, wind and solar radiation. The results showed that the air temperature of the Langsep street ranged between 28.28 - 34.59 °C with humidity ranged between 49.36 - 67.89%. Average of air temperature on Langsep street 30.2 °C and an average humidity of 60%. Langsep street has a value of THI (27.60) that out of the comfort standards set by Laurie [4] at 21-27. In the street area that has a dense spacing of the plants tend to lower air temperature and humidity tends to be high. Vice versa on street area with rarely spacing of plants shows air temperature tends to be high with low humidity.

5. Suggestion

Air temperature and humidity can be modified by selecting the appropriate type of vegetation shade. To scale street in the city, can be used by the plant canopy of shade plants that have root systems that do not damage the construction of roads, branching plants are not easily broken and easy to maintain. Necessary to add more vegetation such as Tanjung (*Mimusops Elengi*), Kencana Ketapang (*Terminalia mantaly*), glodokan tiang (*Polyalthia longifolia*), trembesi (*Samanea saman*), Kiara Payung (*Fellicium Decipiens*) and Angsana (*Pterocarpus indicus*). By selecting the appropriate shade of vegetation and treatment is expected to help increase the level of comfort in every way. In addition to using vegetation shade, combining different types of landscape plants that have different growth patterns such as the use of groundcover and shrubs, manipulate the environment on the way to be more comfortable.

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09TH - 10TH NOVEMBER 2016

Department of Landscape Architecture, Faculty of Agriculture

Bogor Agricultural University (IPB)

Bogor, Indonesia

November 09th 2016

Dr. Ir. Agus Purwito, M.Sc.Agr.

Dean of The Faculty of Agriculture

Bogor Agricultural University

IOP esri Sentul City

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SURAT TUGAS

Nomor : 4570 /TB- FP/KP-220/XI/2016

Yang bertanda tangan di bawah ini:

Nama	: **Dr. Ir. Widowati, MP**
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Memberikan tugas kepada:

Nama	: **Irawan Setyabudi, ST., MT**
NIDN	: 0730058603
Jabatan	: Dosen Program Studi Arsitektur Lanskap

Sebagai Pemakalah dalam Simposium The 2nd International Symposium for Sustainable Landscape Development dengan judul "The Concept of Historical Landscape Design at Watugong Archaeological Site Area in Malang City" yang diselenggarakan oleh Arsitektur Lanskap, Insitut Pertanian Bogor di Institut Pertanian Bogor, Bogor pada tanggal 9 - 10 November 2016.

Demikian surat tugas ini dibuat, untuk dapat dipertanggungjawabkan sebagaimana mestinya.

Malang, 6 November 2016
Dekan,

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SURAT PERINTAH PERJALANAN DINAS

Nomor : 4570 /TB.FP/TU–420/XI/2016

1.	Pejabat yang berwenang memberi perintah	Dekan Fakultas Pertanian
2.	Nama yang diperintahkan	Irawan Setyabudi, ST., MT
3.	Jabatan	Dosen Arsitektur Lanskap
4.	Maksud Perjalanan Dinas	Sebagai Pemakalah dalam Simposium The 2nd International Symposium for Sustainable Landscape Development
5.	Tempat Tujuan	Institut Pertanian Bogor, Bogor
6.	Lamanya Tugas : Hari / Tanggal berangkat Hari / Tanggal kembali	2 (dua) hari. Senin, 9 November 2016 Selasa, 10 November 2016
7.	Pengikut	-
9.	Pembebanan Biaya	-
10.	Keterangan Lain Dianggap Penting	-

Telah Datang

_____

Dikeluarkan : Di Malang
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